

some respects Euclid's prolixity, recalling over and over again propositions which have gone before, does much to fix them in the memory of the learner and prevent looseness in reasoning, and though we think Euclid's style admits with advantage of some pruning, we feel that Mr. Nixon, with overstrained regard to the examination hall, has used the knife too freely, and has run the risk by his style and free use of abbreviations and signs of letting the young pupil believe, as he is only too glad and ready to do, that mathematical work should be written after the fashion of a telegram, grammar disregarded, articles and little words omitted, and what should be sentences written without verb or copula.

Mr. Nixon has deliberately omitted the usual marginal references, on the ground that "learners (1) very generally ignore them; and (2) will gain greater benefit by having to hunt up the references themselves." We believe he has thereby seriously injured the value of his book. Because many boys, in the hands of a careless teacher and left to themselves, ignore the references, is hardly a good reason why they should not be supplied for those who would use them, or who would be required by their teacher to use them; and they would be exceptional pupils under exceptional teachers who could be depended on, or find it easy, "to hunt up the references themselves." Doubtless the exercise of doing this is excellent, but the beginner needs some help in doing it.

We have thought it would be most useful to dwell at some length on Mr. Nixon's revision of Euclid's text, and can only notice generally the exercises and addenda, which occupy more than half the book. The collection of exercises appears to be very well chosen and complete, though we should have been glad to see more of them interspersed among the propositions from which they naturally flow.

The addenda include all the more important developments of the elementary geometry, as well as an introduction to many of the methods of the higher geometry. As a collection of results in the geometry of the straight line and circle this part of the book appears to us from a cursory perusal to be excellent, giving a full account of the important relations of the triangle and its associated circles, centres of similitude, coaxial circles, &c.; while for methods the elementary notions and use of cross ratios, harmonic ranges, inversion, poles and polars are explained and applied to such an extent as to prepare the student naturally for their application to geometry beyond that of the straight line and circle. We fail, however, to find such prominence given to the great principles of duality and reciprocity as their importance, scarcely less in elementary than in the higher geometry, appears to us to demand.

The typography, and the accuracy and clearness of the figures, are to be commended as worthy of the Clarendon Press.

R. B. H.

OUR BOOK SHELF

Practical Histology and Pathology. By Heneage Gibbes, M.D. Third Edition. (London: H. K. Lewis, 1885.) The text in this edition does not, on the whole, differ much from that of the previous editions, some new useful formulæ of staining and a more comprehensive arrangement of the subject-matter being the chief differences.

The tables given at the end of the book as to the conversion of degrees of Centigrade into Fahrenheit and vice versa, as to the conversion of English weights and measures into French, are in some points incorrect, and might have been easily correctly copied from any standard work.

E. KLEIN

Farm Live-Stock of Great Britain. By Robert Wallace, F.C.S. F.H.A.S., &c., Professor of Agriculture and Rural Economy in the University of Edinburgh. (London: Simpkin, Marshall, and Co.; Edinburgh: Oliver and Boyd, 1885.)

WITHIN 200 pages octavo, of rather large type, does Prof. Wallace condense much useful information upon farm live-stock. It must, however, be evident that to treat of cattle, sheep, swine, and horses, from a biological, an agricultural, and an economical point of view would at least require double the number of pages, containing twice the number of words, and folded quarto. Brevity has been said to be the soul of wit; but in a work such as this we cannot but feel that it must be intended by its author either for those who know nothing or for those who know something of the subject. It appears to us to fall short of the requirements of each of these classes of readers. Four and a half lines—forty words, in fact—upon the Devon breed of cattle cannot be considered adequate, however terse and compressed they may be (and to the point they undoubtedly are), to giving a good word-picture of this race. Besides, Prof. Wallace must excuse us for differing from him as to his statements even in this very short description. He is wrong in saying "colour blood-red, no white." There is white upon the fore-udder in almost all Devon cattle, and it is unfortunate that there should be a manifest error in this very short description of an important breed.

The book aims at too much, and is too vague in its general plan. The writer is successful in being concise, but he is not free from errors, and a greater amplitude in his observations would have both conferred a greater general interest upon his pages, and been more satisfactory to an earnest student of agriculture. Let us hope shortly to see an enlarged edition.

Common-Sense Euclid. Books I. and II. Part I. By the Rev. A. D. Capel, M.A., St. John's College, Cambridge. (London: Joseph Hughes, 1886.)

THE object of this book, as the author tell us, is to point out, especially to teachers and those teaching themselves, the portions of the treatise which either present difficulties to the beginner or escape their notice altogether.

The propositions are explained in a very clear and concise way, some of them being even worked backwards and their analysis being made in every case; explanations are given, here and there, where they are most required, and are put in the easiest possible way. Problems, at the end of each proposition and also at the end of the book, are given, making a total of 300, followed by hints for their solution.

The figures are not placed opposite each proposition, as they are in most editions, but all together at the end. The plan adopted is a very good one, it being understood that the student must construct the figures for himself.

J.

Arithmetic for Schools. By the Rev. J. B. Lock, M.A. (London: Macmillan and Co., 1886.)

THIS is a carefully prepared school-book, forming, as to scope, a sort of arithmetic mean between Hamblin Smith's and Brook Smith's or Muir's. It contains the usual rivulets of text ending in seas of examples. In the purely arithmetical part of the book logical accuracy is attempted with considerable success. Want of grasp is much more evident in the part which deals with the applications. There the division into subjects is strangely illogical, and

slight inaccuracies of thought and language occur. Is it really the case, for example, that rate of interest (p. 181) is totally independent of time?

LETTERS TO THE EDITOR

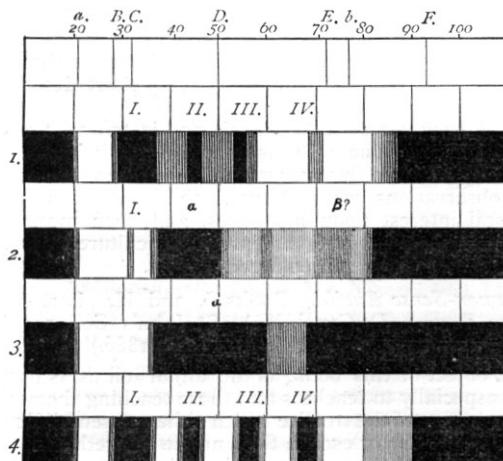
[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Chlorophyll

IN a short note in NATURE (vol. xxxii, p. 342) I mentioned the discovery of a colourless substance produced by the action of reducing agents on chlorophyll and regenerating, on being exposed to the air, the original green solution. I may be allowed to add to my previous statement that if this reaction is not pushed too far and the resulting substance is duly concentrated, it is not colourless, but of a reddish-brown by daylight, of a splendid ruby red (very different from the well-known port-wine red colour of chlorophyll) by limelight. Its spectrum is chiefly characterised by the total absence of band I., and the presence of a broad band corresponding exactly to band II., and the two intervals between I. and II., and between II. and III. Band IV. seems also to be present, though somewhat altered in its position and intensity.

The presence of a slightest trace of oxygen is immediately announced by the appearance of the I. chlorophyll band, so



that the reaction may be considered as a most sensitive test for oxygen. On further exposure to the air, as already mentioned, chlorophyll is regenerated. This new substance being evidently a product of reduction of *chlorophylline*, the green-colouring matter of chlorophyll isolated and described by me in 1869, it may be called *protochlorophylline*, or simply *protochlorophylline*.

Its solutions can be kept in sealed glass tubes containing H_2 or CO_2 : in this latter case in a dark place, for on being exposed to light they turn green. Can it be inferred from these facts that the oxidation takes place at the expense of CO_2 —that carbonic acid is actually reduced under the joint action of light and of a chlorophyll solution? The question, if answered in the affirmative, is of so great importance, that I am now taking all the pains to arrive at a definite conclusion.

The optical properties of *protochlorophylline* seem to indicate its presence in freshly-prepared chlorophyll solutions. Indeed the difference presented by the spectrum of a freshly-prepared green solution and that of Mr. Stokes's modified chlorophyll may be easily accounted for by the presence in the former of the broad *protochlorophylline* band intercepting the rays of light in the two intervals between the bands I. II. and III., as just mentioned. To the presence of different quantities of *protochlorophylline* may be likewise attributed the varying relative intensity of the bands II. III. IV.,—a fact that has attracted the attention of many observers.

At all events, it cannot be doubted that the study of this curious substance, though attended with considerable difficulties, all the operations taking place in a total absence of oxygen, and under the continual control of the spectroscope, will throw a new light on that most important of physiological problems—the part played by chlorophyll in the decomposition of carbonic acid by the living plant.

C. TIMIRIAZEFF

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The Stone Age in the Malay Peninsula

IN NATURE, vol. xxxiii. p. 377, there is a notice of a paper by M. de Morgan, published in *Cosmos*, on the Stone Age in the Malay Peninsula. Will you permit me to offer a few remarks with reference to this matter. In the first place, it is said that M. de Morgan came into contact with three native races, which he respectively names Sakayes [Sakai], Seumangs [Sémang], and Rayats [Ryot]. I have put in brackets the commonly-accepted spelling in the Straits. It is funny what peculiar mistakes travellers make when passing through a country the language of which they do not understand, ryot being the word used in the Straits to express those followers or retainers of a native chief who are not actually his debt slaves, but who owe him more or less of feudal allegiance; Malays here invariably use the word when speaking of the following of a Sakai chief. The word ryot is, I believe, also used in the same sense in India. With reference to the tribes of whom M. de Morgan speaks as living in the recesses of the mountains, and whom the Sakaias called "fire apes," I cannot help remarking that I have never heard the Sakaias speak of them myself, nor can I find that any other Government servant here has heard of them either; still we are in pretty constant communication with certain of the Sakaias of these hills, and for my part I have at different times stayed for longer and shorter periods at the clearings of some of the chiefs whom M. de Morgan visited, and moreover I have employed most of the same Malays who followed M. de Morgan. By the bye, these were Sumatran Malays, and they told me some very extraordinary tales about the wild tribes before I started up country with them; these foreign Malays are especially addicted to telling marvellous tales of the wild tribes of the mountains, but so far I have not been able to verify their information in the least degree either from the Sakaias themselves or from native Malay sources. It would be interesting to know what equivalent was used for the expression "fire apes." Was it a Malay word or a Sakai word? With reference to the Stone Age I quite agree with M. de Morgan in believing that at a not very late period—probably just before the Malay invasion—there were tribes living in the interior who were not acquainted with the use of iron; up to the present moment I have been able to collect twenty-two stone implements. I have sent drawings and notices of these to the Anthropological Institute. I may, however, here mention that of these twenty-two specimens one is the half of a stone bracelet; the rest are all chopping-tools of different descriptions, used, I think we may fairly conclude, by a race of boat-builders, who most likely constructed dug-outs, much like the Malays of the present day. I adduce this supposition from the fact that of my twenty-one specimens two are perfect gouges, and six others are of the description which Dr. Evans has classed under adzes. The cutting-edges of nearly all my specimens have been considerably damaged by use. The high polish which M. de Morgan's specimens—and mine also—exhibit is, I think, accounted for in a great measure by the fact that they are used and very highly prized by the Malays as whetstones; the women preserve them, especially to sharpen their razors on, with which they shave the heads of their children during the periods ordered by custom or religious law; and the men were, until lately, very anxious to procure them to sharpen the iron spurs used in cock-fighting. As almost all of the specimens procured by me have been purchased of Malays who have inherited them from their ancestors, and prized them as heir-looms, it is, I think, reasonable to suppose that in their original condition some of them, at least, were considerably rougher than when they came into our hands; this supposition is further confirmed by a remark made to me the other day by a Malay chief. He said that he once had a thunderstone given to him which was so rough that he had to wear it down on his emery-wheel before he could use it as a whetstone. I have one specimen which has no cutting-edge, but is squared off at each end and is almost spindle-shaped. I have